Answer to Assignment 1

| Question No. | Answer |
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| 1. | (a)15/16 or 15/32 <br> (b)1/3 or 2/3 <br> (c)5/16 or 5/8; 47/96 or 47/48; 5/16 or 5/8; 5/32 or 5/16; 1/96 or 1/48; 1/48 or 1/24 |
| 2. | (i) 1/66 (ii) Prove it |
| 3. | do it |
| 4. | 35/59 |
| 5. | $P(A) = 4(x - x^2)$ |
| 6. | 319/324 |
| 7. | $\dfrac{mp}{mp + 1 - p}$ |
| 8. | (i) Prove it (ii) Prove it |
| 9. | (i) Do it |
| 10. | (i) 1/2, 1/3 (ii) 1/2, 1/3 |
| 11. | Prove it |
| 12. | Prove it |
| 13. | (a) Verify it (b) Verify it |
| 14. | $P(X = 1) = 0.032 \quad P(X = 2) = 0.891 \quad P(X = 3) = 0.684$ |
| 15. | $P(X_i = 1) = \dfrac{19}{27} \qquad P(X_i = 0) = \dfrac{8}{27}$ <br><br> $F_Y(y) = \begin{cases} 0 & -\infty < y < 0 \\ \dfrac{1}{3} & 0 \le y < 1 \\ \dfrac{5}{9} & 1 \le y < 2 \\ \dfrac{19}{27} & 2 \le y < 3 \\ 1 & y \ge 3 \end{cases}$ <br> $E(Y) = 3.55$ |
| 16. | $0 < k < 1; \ \dfrac{k}{1-k}$ |
| 17. | Prove it $(i)\ e^{-2}\ (ii)0\ (iii)\dfrac{2}{3}\left(e^{-\frac{5}{3}} - e^{-\frac{8}{3}}\right) + \dfrac{1}{3}\left(e^{-1} - e^{-2}\right)$ |
| 18. | (a) $F_X(x) = 1 - e^{-\frac{x}{3}} - \dfrac{x}{3} e^{-\frac{x}{3}}, \ E(X) = 6, \ V(X) = 18$ <br><br> (b) $1 - \dfrac{3}{e^2}$ |
| 19. | Mode of the distribution $x = \dfrac{2}{3}$ |
| 20. | Prove it |
| 21. | 3/8 |

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| 22. | 61/140; 40/61 |
| 23. | 7/64 |
| 24. | 0.92 |
| 25. | 0.5 |
| 26. | 1/3 |
| 27. | 1/3 |
| 28. | 0.36 |
| 29. | 3/4 |
| 30. | Prove it |
| 31. | Prove it |
| 32. | 0.26 |
| 33. | 0.9604 |
| 34. | 0.01536; 0.0256 |
| 35. | 0.0838 |
| 36. | 0.017 |
| 37. | 1/2 |
| 38. | Do it |
| 39. | Do it |
| 40. | Do it |
| 41. | Do it |
| 42. | Do it |
| 43. | Prove it |
| 44. | Prove it |
| 45. | 1/3 |
| 46. | Do it |
| 47. | |
| 48. | 0; 1/6 |
| 49. | 1 |
| 50. | 5/6 |
| 51. | $E(X) = 2$ |
| 52. | 2 |
| 53. | 0 |
| 54. | Do it |
| 55. | Prove it |
| 56. | 0.3078, 0.4803, 0.7711, 0.3030 |
| 57. | Do it |
| 58. | Prove it |
| 59. | Prove it |
| 60. | Do it |
| 61. | 0.9022 |
| 62. | Prove it |
| 63. | 4/7; 2/7 |
| 64. | Do it |
| 65. | 6; 1/2; Do it |
| 66. | Prove it |